

(12) **UK Patent Application** (19) **GB** (11) **2 244 717** (13) **A**  
(43) Date of A publication 11.12.1991

(21) Application No 9110862.1

(22) Date of filing 20.05.1991

(30) Priority data

(31) 185490

(32) 23.05.1990

(33) IE

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(51) INT CL<sup>6</sup>

**A23D 7/00**

(52) UK CL (Edition K)

**C5C CPD C401 C405 C407 C410 C412 C414 C416**

**U1S S1089**

(56) Documents cited

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(58) Field of search

**UK CL (Edition K) C5C CPD CPE CPF**

**INT CL<sup>6</sup> A23D**

**Online database: WPI**

(54) **An edible fat blend and an edible fat spread**

(57) An edible fat blend comprising monounsaturated fatty acids which constitute 25% to 80% by weight of the fat blend; the monounsaturated fatty acids are derived from at least olive oil which constitutes at least 25% by weight of the fat blend. Also disclosed is an edible spread comprising the edible fat blend and a method of preparation of said spread.

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AN EDIBLE FAT BLEND AND AN EDIBLE SPREAD

The present invention relates to an edible fat blend, and an edible spread comprising the fat blend, as well as to a method for preparing the edible spread.

High blood cholesterol is known to be a contra-factor  
5 for coronary heart disease. Blood cholesterol  
comprises two main fractions, namely, low density  
lipoprotein cholesterol and high density lipoprotein  
cholesterol. Low density lipoprotein cholesterol has  
been identified as the main fraction connected to  
10 coronary heart disease. Low density lipoprotein  
cholesterol tends to build up and line the arteries,  
thus leading to coronary heart disease. On the other  
hand, high density lipoprotein cholesterol tends to  
have a scavenging effect and prevents the build up of  
15 low density lipoprotein cholesterol on the arteries.  
It has been known for some time that the intake of  
saturated fatty acids has little or no effect on high  
density lipoprotein cholesterol. However, saturated  
fatty acids lead to a rise in low density lipoprotein  
20 cholesterol. For this reason, spreads and other  
foodstuffs high in saturated fatty acids have been  
recommended against. In an effort to reduce coronary  
heart disease, spreads and other foodstuffs high in  
polyunsaturated fatty acids have been widely promoted  
25 for many years due to the fact that the intake of  
polyunsaturated fatty acids tends to reduce low density  
lipoprotein cholesterol in the blood.

However, it is has now been found that as well as  
reducing the level of low density lipoprotein  
cholesterol in the blood, polyunsaturated fatty acids  
have the adverse effect of also depressing the level of  
5 high density lipoprotein cholesterol in the blood.  
Accordingly, the value of spreads and other foodstuffs  
containing polyunsaturated fatty acids for reducing  
coronary heart disease is now questionable.

There is therefore a need for an edible spread and an  
10 edible fat blend which does not suffer from the  
disadvantages of those spreads and foodstuffs high in  
polyunsaturated fatty acids.

The present invention is directed towards providing  
such a spread and fat blend and the invention is also  
15 directed to a method for producing the spread.

According to the invention, there is provided an edible  
fat blend comprising a blend of fatty acids, the blend  
comprising monounsaturated fatty acids which constitute  
in the range of 25% to 80% by weight of the fat blend,  
20 the monounsaturated fatty acids being derived from at  
least olive oil, and the olive oil constituting at  
least 25% by weight of the fat blend.

Preferably, the olive oil constitutes in the range of

30% to 80% by weight of the fat blend, and  
advantageously, the olive oil constitutes in the range  
of 30% to 75% by weight of the fat blend. In preferred  
embodiments of the invention, the olive oil constitutes  
5 in the range of 30% to 70% by weight of the fat blend.

In some aspects of the invention, the monounsaturated  
fatty acids are partly derived from one or more of the  
following additional vegetable oils:

rapeseed oil,  
10 canola oil,  
a genetically engineered sunflower oil sold under  
the trade name TRISUN,  
peanut or ground nut oil,  
soya bean oil, and  
15 palm oil.

In one embodiment of the invention, the additional  
vegetable oil constitutes up to 50% by weight of the  
fat blend, and preferably, the additional vegetable oil  
constitutes in the range of 25% to 50% by weight of the  
20 fat blend. In a preferred embodiment of the invention,  
the additional vegetable oil is rapeseed oil, and  
preferably, the rapeseed oil constitutes in the range  
of 10% to 50% by weight of the fat blend.  
Advantageously, the rapeseed oil constitutes in the  
25 range of 25% to 40% by weight of the fat blend.

Preferably, the olive oil is refined and de-odourized, and preferably, additional vegetable oils are also refined and de-odourized.

In another embodiment of the invention, the fat blend  
5 comprises a relatively hard fat. This is particularly desirable where the fat blend is for subsequent use as an edible spread.

Preferably, the relatively hard fat constitutes in the range of 15% to 60% by weight of the fat blend, and  
10 advantageously, the relatively hard fat constitutes in the range of 20% to 40% by weight of the fat blend, and in certain cases, the relatively hard fat constitutes in the range of 23% to 37% by weight of the fat blend.

In preferred embodiments of the invention, the  
15 relatively hard fat may be selected from any one or more of the following relatively hard fats:

butter fat,

a higher melting point butter fat fraction, and  
hardened vegetable oil.

20 Where the relatively hard fat is hardened soya bean oil, it is preferable that the soya bean oil should constitute in the range of 20% to 40% by weight of the fat blend, and where the relatively hard fat is butterfat, it is preferable that the butter fat should

constitute in the range of 30% to 60% by weight of the fat blend.

In a preferred embodiment of the invention, the monounsaturated fatty acids constitute in the range of 30% to 75% by weight of the fat blend, and preferably, the monounsaturated fatty acids constitute in the range of 40% to 70% by weight of the fat blend.

Additionally, the fat blend comprises saturated fatty acids, and preferably, the saturated fatty acids constitute in the range of 5% to 50% by weight of the fat blend. Advantageously, the saturated fatty acids constitute in the range of 10% to 45% by weight of the fat blend, and, in general, the saturated fatty acids constitute in the range of 15% to 40% by weight of the fat blend.

Further, the fat blend comprises polyunsaturated fatty acids, the polyunsaturated fatty acids constituting in the range of 5% to 50% by weight of the fat blend, and, preferably, the polyunsaturated fatty acids constitute in the range of 7% to 30% by weight of the fat blend.

Additionally, the invention provides an edible spread comprising a fat phase and an aqueous phase, the fat phase comprising the fat blend according to the invention, and constituting in the range of 5% to 95%

by weight of the spread, and preferably, the fat phase constitutes in the range of 15% to 85% by weight of the spread, and, advantageously, the fat phase constitutes in the range of 20% to 80% by weight of the spread.

- 5 In some examples, the fat phase comprises an emulsifying agent, and preferably, the emulsifying agent is selected from any one or more of the following emulsifying agents:

lecithin,  
10 mono and diglycerides, and  
polyglycerol fatty acid ester.

In most examples of the invention, the emulsifying agent constitutes not more than 5% by weight of the fat phase.

- 15 In most examples of the invention, the aqueous phase comprises water.

In some examples of the invention, the aqueous phase comprises a stabilising agent, and preferably, the stabilising agent is selected from any one or more of  
20 the following stabilising agents:

gelatine,  
carrageenin,  
maltodextrin,  
pectin,

sodium alginate, and  
salts of alginic acid such as its sodium salt.

In most examples of the invention, the stabilising  
agent constitutes not more than 10% by weight of the  
5 aqueous phase.

In some examples of the invention, the aqueous phase  
comprises a protein additive, which is preferably  
selected from any one or more of the following  
additives:

10 skimmed milk,  
buttermilk,  
whey,  
reconstituted skimmed milk powder,  
reconstituted whey powder,  
15 milk proteins,  
vegetable proteins, and  
lactic cultures.

In most examples of the invention, the protein additive  
constitutes not more than 15% by weight of the aqueous  
20 phase.

Further, the invention provides a method for preparing  
an edible spread, the method comprising the step of  
forming a water-in-oil emulsion by dispersing an  
aqueous phase to a fat phase, wherein the fat phase



comprises the fat blend according to the invention.  
Preferably, the fat phase constitutes in the range of  
5% to 95% by weight of the water-in-oil emulsion, and  
advantageously, the fat phase constitutes in the range  
5 of 15% to 85% by weight of the water-in-oil emulsion.  
In most examples of the invention, the water-in-oil  
emulsion is maintained at a temperature in the range of  
35°C to 55°C during mixing, and preferably, the water-  
in-oil emulsion is maintained at a temperature in the  
10 range of 40°C to 50°C during mixing. In a preferred  
example of the invention, the water-in-oil emulsion is  
maintained at a temperature of approximately 45°C  
during mixing.

It is preferable that the water-in-oil emulsion is  
15 formed by shear agitation.

The advantages of the invention are many. A  
particularly important advantage of the invention is  
that intake of the edible fat and the spread should  
reduce the risk of coronary heart disease. This is  
20 achieved by virtue of the fact that the edible fat  
blend and edible spread contain monounsaturated fatty  
acids, and it has been found that the intake of  
monounsaturated fatty acids lowers low density  
lipoprotein cholesterol in the blood with virtually no  
25 effect on high density lipoprotein cholesterol,  
accordingly reducing the risk of coronary heart

disease. A further advantage of the fat blend and spread according to the invention is that both provide a balance between fat intake and nutrition.

The invention will be more clearly understood from the following description of some preferred examples thereof, which are given solely for the purposes of illustrating the invention and are not in any way intended to limit the scope of the invention.

In each example, an edible spread according to the invention is prepared using a method according to the invention. A water-in-oil emulsion is prepared from an aqueous phase and a fat phase. In each example, the fat phase is an edible fat blend also according to the invention which comprises monounsaturated fatty acids. The monounsaturated fatty acids are derived from olive oil in all the examples, and in the case of Examples 1, 2 and 4, the monounsaturated fatty acids are also derived from an additional vegetable oil, namely, rapeseed oil. In all the examples, some of the monounsaturated fatty acids is also derived from hardened soya bean oil. The olive oil and rapeseed oil used in the examples is refined and de-odourized. The monounsaturated fatty acids content of the olive oil is 70% by weight, the polyunsaturated fatty acids content of the olive oil is 16% by weight and the saturated fatty acids content of the olive oil is 14% by weight.

The rapeseed oil used in Examples 1, 2 and 4 has a monounsaturated fatty acids content of 63% by weight, a polyunsaturated fatty acids content of 30% by weight, and a saturated fatty acids content of 6% by weight.

- 5 In all cases, the fatty acids content of the olive oil and rapeseed oil given above is the content after refining and de-odourizing.

The hardened soya bean oil used in the examples is refined and de-odourized and has a slip point of 41°C.

- 10 Although needless to say, the slip point may lie in the range of 36°C to 42°C.

In the examples, the fat phase and aqueous phase are prepared simultaneously, although needless to say, this is not necessary.

15 Example 1

In this example, the fat blend is prepared from the following ingredients in the percentages by weight of the total fat blend set out below:

|    |                        |   |        |
|----|------------------------|---|--------|
|    | olive oil              | - | 34.2%  |
| 20 | rapeseed oil           | - | 32.9%  |
|    | hardened soya bean oil | - | 31.5%  |
|    | mono and diglycerides  | - | 1.2%   |
|    | beta carotene          | - | 0.007% |

The fats, namely, olive oil, rapeseed oil and hardened

soya bean oil are heated to approximately 45°C and blended together. The beta carotene which acts as a colouring agent is blended with the fats. The mono and diglycerides which act as emulsifying agents are then  
 5 blended with the blended fats. The fat blend which forms the fat phase for the spread is maintained at a temperature of approximately 45°C during blending.

The aqueous phase is prepared from the following ingredients in the percentages by weight of the total  
 10 aqueous phase set out below:

|    |                   |   |                      |
|----|-------------------|---|----------------------|
|    | water             | - | 94%                  |
|    | salt              | - | 2.5%                 |
|    | sodium alginate   | - | 1.6%                 |
|    | whey powder       | - | 0.8%                 |
| 15 | potassium sorbate | - | 0.16%                |
|    | lactic acid       | - | 0.05% approximately. |

The water at a temperature of approximately 75°C and the salt are thoroughly mixed, and the whey powder which contains protein and acts as a protein additive  
 20 is blended in with the water and salt mix. The potassium sorbate, which acts as a preservative, is also blended with the water and salt mix. The pH of the aqueous phase is adjusted to 6 to 6.4 by the addition of the lactic acid. The sodium alginate which  
 25 acts as a stabilising agent is also blended with the water and salt mix. The temperature of the aqueous

phase is adjusted to approximately 45°C.

The edible spread is prepared by preparing a water-in-oil emulsion. The aqueous phase at a temperature of approximately 45°C is dispersed in the fat phase which  
5 is also at approximately 45°C in the proportion of sixty parts by weight of the aqueous phase to forty parts by weight of fat phase. The water-in-oil emulsion is formed by subjecting the dispersion of aqueous phase and fat phase to shear agitation for a  
10 period of fifteen minutes while the temperature is maintained at 45°C.

The water-in-oil emulsion is then pasteurized at a temperature of 80°C for ten seconds in a scraped surface pasteurizer, and is chilled and crystallized in  
15 a scraped surface heat exchanger. The spread is then ready for use and is suitable for packing in a tub.

On analysis, it has been found that the spread prepared according to this example has acceptable physical and organoleptic properties.

20 The fat blend constitutes 40% by weight of the total weight of the spread of this example. Of the fatty acids of the fat blend, approximately 16% by weight are saturated, and 84% by weight are unsaturated. Monounsaturated fatty acids constitute 63% by weight of

the fat blend, while polyunsaturated fatty acids constitute 21% by weight of the fat blend.

Accordingly, the monounsaturated fatty acids constitute approximately 25% by weight of the spread, the

5 polyunsaturated fatty acids constitute approximately 8% by weight of the spread, and saturated fatty acids constitute approximately 6% by weight of the spread.

#### Example 2

In this example, the fat blend is prepared from the  
10 following ingredients in the percentages by weight of the total fat blend set out below:

|    |                        |   |        |
|----|------------------------|---|--------|
|    | olive oil              | - | 33.3%  |
|    | rapeseed oil           | - | 33.3%  |
|    | hardened soya bean oil | - | 33.0%  |
| 15 | lecithin               | - | 0.33%  |
|    | beta carotene          | - | 0.002% |

The fats, namely, olive oil, rapeseed oil and hardened soya bean oil are heated to approximately 45°C and blended together. The beta carotene which acts as a  
20 colouring agent, and the lecithin which acts as an emulsifying agent are blended with the blended fats. The fat blend which forms the fat phase for the spread is maintained at a temperature of approximately 45°C during blending.

25 The aqueous phase is prepared from the following

ingredients in the percentages by weight of the total aqueous phase set out below:

|       |   |     |
|-------|---|-----|
| water | - | 91% |
| salt  | - | 9%  |

- 5 The water is heated to approximately 75°C and the salt is thoroughly mixed with the water to form the aqueous phase. The temperature of the aqueous phase is adjusted to 45°C.

- 10 The edible spread is prepared by preparing a water-in-oil emulsion. The aqueous phase at a temperature of approximately 45°C is dispersed in the fat phase which is also at approximately 45°C in the proportion of twenty parts by weight of aqueous phase to eighty parts by weight of fat phase. The water-in-oil emulsion is
- 15 formed by subjecting the dispersion of aqueous phase and fat phase to shear agitation for a period of ten minutes while the temperature is maintained at 45°C.

- The water-in-oil emulsion is then pasteurized at a temperature of 80°C for ten seconds in a scraped
- 20 surface pasteurizer, and is chilled and crystallized in a scraped surface heat exchanger. The spread is then ready for use and is suitable for packing in a tub.

On analysis, it has been found that the spread prepared according to this example has acceptable physical and

organoleptic properties.

The fat blend constitutes 80% by weight of the total weight of the spread of this example. Of the fatty acids of the fat blend, approximately 15% by weight are saturated and 85% by weight are unsaturated. Monounsaturated fatty acids constitute 68% by weight of the fat blend, while polyunsaturated fatty acids constitute 17% by weight of the fat blend. Accordingly, monounsaturated fatty acids constitute approximately 54% by weight of the spread, polyunsaturated fatty acids constitute approximately 14% by weight of the spread, and saturated fatty acids constitute approximately 12% by weight of the spread.

### Example 3

In this example, the fat blend is prepared from the following ingredients in the percentages by weight of the total fat blend set out below:

|    |                        |   |        |
|----|------------------------|---|--------|
|    | olive oil              | - | 37.5%  |
|    | hardened soya bean oil | - | 12.5%  |
| 20 | butterfat              | - | 48.8%  |
|    | mono and diglycerides  | - | 1.2%   |
|    | beta carotene          | - | 0.002% |

The fats, namely, olive oil, hardened soya bean oil and butterfat are heated to approximately 45°C and blended together. The beta carotene which acts as a colouring



agent and the mono and diglycerides which act as an emulsifying agent are blended with the blended fats. The fat blend which forms the fat phase for the spread is maintained at a temperature of approximately 45°C during blending.

The aqueous phase is prepared from the following ingredients in the percentages by weight of the total aqueous phase set out below:

|    |                   |   |                     |
|----|-------------------|---|---------------------|
|    | water             | - | 85.8%               |
| 10 | salt              | - | 2.33%               |
|    | sodium caseinate  | - | 11.7%               |
|    | potassium sorbate | - | 0.17%               |
|    | lactic acid       | - | 0.06% approximately |

The water at approximately 75°C and salt are thoroughly mixed, and the potassium sorbate which acts as a preservative are blended with the water and salt mix. The sodium caseinate which is high in protein and acts as a stabilising agent is then blended with the water and salt mix. The pH of the aqueous phase is adjusted to 6.2 by the addition of lactic acid. The temperature of the aqueous phase is adjusted to approximately 45°C.

The edible spread is prepared by preparing a water-in-oil emulsion. The aqueous phase at the temperature of approximately 45°C is dispersed in the fat phase which is also at 45°C in the proportion of sixty parts by

weight of aqueous phase to forty parts by weight of fat phase. The water-in-oil emulsion is formed by subjecting the dispersion of aqueous and fat phase to shear agitation for a period of fifteen minutes while  
5 the temperature is maintained at 45°C.

The water-in-oil emulsion is then pasteurized at a temperature of 80°C for ten seconds in a scraped surface pasteurizer, and is chilled and crystallised in a scraped surface heat exchanger. The spread is then  
10 ready for use and is suitable for packing in a tub.

On analysis, it has been found that the spread prepared according to this example has acceptable physical and organoleptic properties.

The fat blend constitutes 40% by weight of the total  
15 weight of the spread of this example. Of the fatty acids of the fat blend, approximately 40% by weight are saturated and 60% by weight are unsaturated.

Monounsaturated fatty acids constitute 50% by weight of the fat blend, while polyunsaturated fatty acids  
20 constitute 10% by weight of the fat blend.

Accordingly, monounsaturated fatty acids constitute approximately 20% by weight of the spread, polyunsaturated fatty acids constitute approximately 4% by weight of the spread, and saturated fatty acids  
25 constitute approximately 15% by weight of the spread.

Example 4

In this example, the fat blend is prepared from the following ingredients in the percentages by weight of the total fat blend set out below:

|   |                        |   |        |
|---|------------------------|---|--------|
| 5 | olive oil              | - | 34%    |
|   | rapeseed oil           | - | 32.1%  |
|   | hardened soya bean oil | - | 32.5%  |
|   | mono and diglycerides  | - | 1.4%   |
|   | beta carotene          | - | 0.002% |

- 10 The fats, namely, olive oil, rapeseed oil and hardened soya bean oil are heated to approximately 45°C and blended together. The beta carotene which acts as a colouring agent and the mono and diglycerides which act as an emulsifying agent are blended with the fats. The
- 15 fat blend which forms the fat phase for the spread is maintained at a temperature of approximately 45°C.

The aqueous phase is prepared from the following ingredients in the percentages by weight of the total aqueous phase set out below:

|    |                   |   |                     |
|----|-------------------|---|---------------------|
| 20 | water             | - | 95.0%               |
|    | salt              | - | 2.33%               |
|    | whey powder       | - | 1.67%               |
|    | sodium alginate   | - | 0.83%               |
|    | potassium sorbate | - | 0.17%               |
| 25 | lactic acid       | - | 0.05% approximately |

The water at approximately 75°C and salt are thoroughly mixed together. The whey powder which contains protein is blended with the water and salt mix. The potassium sorbate which acts as a preservative is also blended  
5 with the water and salt mix. The sodium alginate which acts as a stabilising agent is then blended with the mixture. The pH of the aqueous phase is adjusted to 6.2 by the addition of lactic acid. The temperature of the aqueous phase is adjusted to approximately 45°C.

10 The edible spread is prepared by preparing a water-in-oil emulsion. The aqueous phase at a temperature of 45°C is dispersed in the fat phase which is also at approximately 45° in the proportion of sixty parts by weight of aqueous phase to forty parts by weight of fat  
15 phase. The water-in-oil emulsion is formed by subjecting the dispersion of aqueous phase and fat phase to shear agitation for a period of fifteen minutes, while the temperature is maintained at 45°C. In this example, a suitable flavouring agent is added  
20 to the water-in-oil emulsion during agitation. Such flavouring additives will be well known to those skilled in the art.

The water-in-oil emulsion is then pasteurized at a temperature of 80°C for ten seconds in a scraped  
25 surface pasteurizer, and is chilled and crystallised in

a scraped surface heat exchanger. The spread is then ready for use and is suitable for packing in a tub.

On analysis, it has been found that the spread prepared according to this example has acceptable physical and  
5 organoleptic properties.

The fat blend constitutes 40% by weight of the total weight of the spread of this example. Of the fatty acids of the fat blend, approximately 15% are saturated and 85% are unsaturated. Monounsaturated fatty acids  
10 constitute 67% by weight of the fat blend, while polyunsaturated fatty acids constitute 18% by weight of the fat blend. Accordingly, monounsaturated fatty acids constitute approximately 27% by weight of the spread, polyunsaturated fatty acids constitute  
15 approximately 7% by weight of the fat spread, and saturated fatty acids constitute approximately 6% by weight of the spread.

#### Example 5

In this example, the fat blend is prepared from the  
20 following ingredients in the percentages by weight of the total fat blend set out below:

|                                       |   |       |
|---------------------------------------|---|-------|
| olive oil                             | - | 68.4% |
| hardened soya bean oil                | - | 23.7% |
| very hard palm oil sold               | - | 2.75% |
| 25 under the Trade Mark LIPODAN HP100 |   |       |

|                               |   |      |
|-------------------------------|---|------|
| mono and diglycerides         | - | 2.5% |
| polyglycerol fatty acid ester | - | 2.5% |

The fats, namely, olive oil, hardened soya bean oil and palm oil are heated to approximately 45°C and blended together. The mono and diglycerides and the polyglycerol fatty acid ester which act as emulsifying agents are then blended with the blended fats. The fat blend which forms the fat phase for the spread is maintained at a temperature of approximately 45°C during blending.

The aqueous phase is prepared from the following ingredients in the percentages by weight of the total aqueous phase set out below:

|    |                     |   |                     |
|----|---------------------|---|---------------------|
| 15 | water               | - | 89.25%              |
|    | salt                | - | 1.25%               |
|    | skimmed milk powder | - | 1.25%               |
|    | maltodextrin        | - | 6.25%               |
|    | MEXPECTIN RS450     | - | 1.9%                |
| 20 | potassium sorbate   | - | 0.1%                |
|    | lactic acid         | - | 0.04% approximately |

The water at a temperature of approximately 75°C and the salt are thoroughly mixed together. The skimmed milk powder which contains protein is blended with the water and salt mix. The potassium sorbate which acts

as a preservative is also blended with the water and salt mix. The MEXPECTIN RS450, which is a trade name for pectin, and the maltodextrin, both of which act as stabilizing agents, are blended with the water and salt mix. The pH of the aqueous phase is adjusted to 6.0 by the addition of lactic acid. The temperature of the aqueous phase is adjusted to approximately 45°C.

The edible spread is prepared by preparing a water-in-oil emulsion. The aqueous phase at a temperature of 45°C is dispersed in the fat phase which is also at approximately 45° in the proportion of eighty parts by weight of aqueous phase to twenty parts by weight of fat phase. The water-in-oil emulsion is formed by subjecting the dispersion of aqueous phase and fat phase to shear agitation for a period of fifteen minutes, while the temperature is maintained at 45°C. In this example, a suitable flavouring agent is added to the water-in-oil emulsion during agitation. Such flavouring additives will be well known to those skilled in the art.

The water-in-oil emulsion is then pasteurized at a temperature of 80°C for ten seconds in a scraped surface pasteurizer, and is chilled and crystallised in a scraped surface heat exchanger. The spread is then ready for use and is suitable for packing in a tub.

On analysis, it has been found that the spread prepared according to this example has acceptable physical and organoleptic properties.

The fat blend constitutes 20% by weight of the total weight of the spread of this example. Of the fatty acids of the fat blend, approximately 17% are saturated and 83% are unsaturated. Monounsaturated fatty acids constitute 64% by weight of the fat blend, while polyunsaturated fatty acids constitute 19% by weight of the fat blend. Accordingly, monounsaturated fatty acids constitute approximately 13% by weight of the spread, polyunsaturated fatty acids constitute approximately 4% by weight of the fat blend, and saturated fatty acids constitute approximately 4% by weight of the spread.

The solid fat profile of the spreads of Examples 1 to 5 is in the range of:

|    |                                 |
|----|---------------------------------|
|    | N5 is in the range of 30 to 40  |
|    | N10 is in the range of 25 to 35 |
| 20 | N15 is in the range of 15 to 25 |
|    | N20 is in the range of 12 to 18 |
|    | N25 is in the range of 6 to 10  |
|    | N30 is in the range of 3 to 7   |
|    | N35 is in the range of 0 to 4   |
| 25 | N40 is in the range of 0 to 2.  |



Accordingly, all the spreads prepared according to the examples are suitable for packing in tubs, for example, tubs of plastics material.

Should it be desired to produce the spreads suitable  
5 for foil or paper wrapping, the fat profile of the spreads would be in the range of:

N5 is in the range of 50 to 60  
N10 is in the range of 35 to 45  
N15 is in the range of 20 to 30  
10 N20 is in the range of 15 to 25  
N25 is in the range of 6 to 10  
N30 is in the range of 3 to 7  
N35 is in the range of 0 to 4  
N40 is in the range of 0 to 2.

15 By increasing the proportions of the relatively hard fats in the fat phase of the examples, the above fat profile would be obtained. This will be well known to those skilled in the art.

The advantages of the spreads produced according to  
20 Examples 1 to 5 are many. In particular, the spreads contain monounsaturated fatty acids, which constitute a relatively high proportion of the total unsaturated fatty acids. As can be seen in all examples, the monounsaturated fatty acids constitutes between 50% and  
25 almost 70% by weight of the fatty acids, and between

13% and 54% by weight of the spread. It is believed that by virtue of this, intake of the spreads should lead to a significant lowering of low density lipoprotein in cholesterol in the blood, while at the same time having relatively no effect on high density lipoprotein cholesterol in the blood. Furthermore, the spreads are relatively high in protein. Furthermore, the addition of protein additives such as whey powder and the addition of sodium caseinate and the like to the aqueous phase further enhances the protein content of the spreads, and in turn their nutritional value.

While in all the examples, the fat blend has been used in the preparation of an edible spread, it will be readily apparent to those skilled in the art that the fat blend could be used for preparing other foodstuffs, for example, mayonnaise, salad dressing and the like. Of course, it will be appreciated that the fat blend may be used in any other foodstuffs.

Needless to say, while it is preferable, it is not essential that the fat phase and aqueous phase should be at the same temperature prior to mixing. In fact, once the fat phase is maintained at a temperature in the range of 35°C to 55°C, it is believed that this should be sufficient.

While in the examples, fat blends comprising specific

proportions of fats which comprise monounsaturated fatty acids have been described, the relative proportions of fats comprising monounsaturated fatty acids may vary considerably.

- 5 Needless to say, other suitable agitating means, pasteurizing means and chilling means may be used as desired.

CLAIMS

1. An edible fat blend comprising a blend of fatty acids, the blend comprising monounsaturated fatty acids which constitute in the range of 25% to 80% by weight  
5 of the fat blend, the monounsaturated fatty acids being derived from at least olive oil, and the olive oil constituting at least 25% by weight of the fat blend.
2. An edible fat blend as claimed in Claim 1 in which the olive oil constitutes in the range of 30% to 80% by  
10 weight of the fat blend.
3. An edible fat blend as claimed in Claim 2 in which the olive oil constitutes in the range of 30% to 75% by weight of the fat blend.
4. An edible fat blend as claimed in Claim 3 in which  
15 the olive oil constitutes in the range of 30% to 70% by weight of the fat blend.
5. An edible fat blend as claimed in any preceding claim in which the monounsaturated fatty acids are partly derived from one or more of the following  
20 additional vegetable oils:
  - rapeseed oil,
  - canola oil,
  - a genetically engineered sunflower oil sold under the trade name TRISUN,

peanut or ground nut oil,  
soya bean oil, and  
palm oil.

6. An edible fat blend as claimed in Claim 5 in which  
5 the additional vegetable oil constitutes up to 50% by  
weight of the fat blend.

7. An edible fat blend as claimed in Claim 6 in which  
the additional vegetable oil constitutes in the range  
of 25% to 50% by weight of the fat blend.

10 8. An edible fat blend as claimed in any of Claims 5 to  
7 in which the additional vegetable oil is rapeseed  
oil.

9. An edible fat blend as claimed in Claim 8 in which  
the rapeseed oil constitutes in the range of 10% to 50%  
15 by weight of the fat blend.

10. An edible fat blend as claimed in Claim 9 in which  
the rapeseed oil constitutes in the range of 25% to 40%  
by weight of the fat blend.

11. An edible fat blend as claimed in any preceding  
20 claim in which the olive oil is refined.

12. An edible fat blend as claimed in any preceding

claim in which the olive oil is de-odourized.

13. An edible fat blend as claimed in any preceding claim in which the fat blend comprises a relatively hard fat.

5 14. An edible fat blend as claimed in Claim 13 in which the relatively hard fat constitutes in the range of 15% to 60% by weight of the fat blend.

15 15. An edible fat blend as claimed in Claim 14 in which the relatively hard fat constitutes in the range of 20% to 40% by weight of the fat blend.

16. An edible fat blend as claimed in Claim 15 in which the relatively hard fat constitutes in the range of 23% to 37% by weight of the fat blend.

15 17. An edible fat blend as claimed in any of Claims 13 to 16 in which the relatively hard fat is selected from any one or more of the following relatively hard fats:  
butter fat,  
a higher melting point butter fat fraction, and  
hardened vegetable oil.

20 18. An edible fat blend as claimed in Claim 17 in which the relatively hard fat is hardened soya bean oil, the

hardened soya bean oil constitutes in the range of 20% to 40% by weight of the fat blend.

19. An edible fat blend as claimed in Claim 17 or 18 in which the relatively hard fat is butter fat, the butter  
5 fat constituting in the range of 30% to 60% by weight of the fat blend.

20. An edible fat blend as claimed in any preceding claim in which the monounsaturated fatty acids constitute in the range of 30% to 75% by weight of the  
10 fat blend.

21. An edible fat blend as claimed in Claim 20 in which the monounsaturated fatty acids constitute in the range of 40% to 70% by weight of the fat blend.

22. An edible fat blend as claimed in any preceding  
15 claim in which the fat blend comprises saturated fatty acids, the saturated fatty acids constituting in the range of 5% to 50% by weight of the fat blend.

23. An edible fat blend as claimed in Claim 22 in which the saturated fatty acids constitute in the range of  
20 10% to 45% by weight of the fat blend.

24. An edible fat blend as claimed in Claim 23 in which the saturated fatty acids constitute in the range of

15% to 40% by weight of the fat blend.

25. An edible fat blend as claimed in any preceding claim in which the fat blend comprises polyunsaturated fatty acids, the polyunsaturated fatty acids  
5 constituting in the range of 5% to 50% by weight of the fat blend.

26. An edible fat blend as claimed in Claim 25 in which the polyunsaturated fatty acids constitute in the range of 7% to 30% by weight of the fat blend.

10 27. An edible fat blend substantially as described herein with reference to and as illustrated in the examples.

28. An edible spread comprising a fat phase and an aqueous phase, the fat phase comprising the fat blend  
15 of any of Claims 1 to 27, and constituting in the range of 5% to 95% by weight of the spread.

29. An edible spread as claimed in Claim 28 in which the fat phase constitutes in the range of 15% to 85% by weight of the spread.

20 30. An edible spread as claimed in Claim 29 in which the fat phase constitutes in the range of 20% to 80% by weight of the spread.



31. An edible spread as claimed in any of Claims 28 to 30 in which the fat phase comprises an emulsifying agent.

32. An edible spread as claimed in Claim 31 in which  
5 the emulsifying agent is selected from any one or more of the following emulsifying agents:

lecithin,  
mono and diglycerides, and  
polyglycerol fatty acid ester.

10 33. An edible spread as claimed in any of Claims 28 to 32 in which the aqueous phase comprises water.

34. An edible spread as claimed in any of Claims 28 to 33 in which the aqueous phase comprises a stabilising agent.

15 35. An edible spread as claimed in Claim 34 in which the stabilising agent is selected from any one or more of the following stabilising agents:

gelatine,  
carrageenin,  
20 maltodextrin,  
pectin,  
sodium alginate, and  
salts of alginic acid such as its sodium salt.

36. An edible spread as claimed in any of Claims 28 to 35 in which the aqueous phase comprises a protein additive, the protein additive being selected from any one or more of the following additives:

- 5       skimmed milk,
- buttermilk,
- whey,
- reconstituted skimmed milk powder,
- reconstituted whey powder,
- 10       milk proteins,
- vegetable proteins, and
- lactic cultures.

37. An edible spread substantially as described herein with reference to the examples.

- 15       38. A method for preparing an edible spread, the method comprising the step of forming a water-in-oil emulsion by dispersing an aqueous phase to a fat phase, wherein the fat phase comprises the fat blend of any of Claims 1 to 37.

- 20       39. A method as claimed in Claim 38 in which the fat phase constitutes in the range of 5% to 95% by weight of the water-in-oil emulsion.

40. A method as claimed in Claim 39 in which the fat phase constitutes in the range of 15% to 85% by weight

of the water-in-oil emulsion.

41. A method as claimed in any of Claims 38 to 40 in which the water-in-oil emulsion is maintained at a temperature in the range of 35°C to 55°C during mixing.

5 42. A method as claimed in Claim 41 in which the water-in-oil emulsion is maintained at a temperature in the range of 40°C to 50°C during mixing.

43. A method as claimed in Claim 42 in which the water-in-oil emulsion is maintained at a temperature of  
10 approximately 45°C during mixing.

44. A method as claimed in any of Claims 38 to 43 in which the water-in-oil emulsion is formed by shear agitation.

45. A method as claimed in any of Claims 38 to 44 in  
15 which a protein additive is added to the aqueous phase, the protein additive being selected from any one or more of the following ingredients:

skimmed milk,  
buttermilk,  
20 whey,  
reconstituted skimmed milk powder,  
reconstituted whey powder,

milk proteins,  
vegetable proteins, and  
lactic cultures.

46. A method as claimed in Claim 45 in which the  
5 protein additive constitutes not more than 15% by  
weight of the aqueous phase.

47. A method as claimed in any of Claims 38 to 46 in  
which an emulsifying agent is blended with the fat  
phase.

10 48. A method as claimed in Claim 47 in which the  
emulsifying agent is selected from any one or more of  
the following agents:

lecithin,  
mono and diglycerides, and  
15 polyglycerol fatty acid ester.

49. A method as claimed in Claim 47 or 48 in which the  
emulsifying agent constitutes less than 5% by weight of  
the fat phase.

50. A method as claimed in any of Claims 38 to 49 in  
20 which a stabilising agent is blended with the aqueous  
phase.

51. A method as claimed in Claim 50 in which the stabilising agent is selected from any one or more of the following stabilising agents:

5       gelatine,  
      carrageenin,  
      maltodextrin,  
      pectin,  
      sodium alginate, and  
      salts of alginic acid such as its sodium salt.

10   52. A method as claimed in Claim 50 or 51 in which the stabilising agent constitutes not more than 10% by weight of the aqueous phase.

53. A method for preparing an edible spread, the method being substantially as described herein with reference  
15   to the examples.